# PATENT ABSTRACTS OF JAPAN

(11)Publication number :        2001-333410

(43)Date of publication of application : 30.11.2001

(51)Int.Cl.                       H04N  7/173

                                  H04H  1/00

                                  H04J  3/00

                                  H04N  5/00

                                  // G06F 17/60

(21)Application number : 2000-        (71)Applicant : SONY CORP

                         150421

(22)Date of filing :     22.05.2000  (72)Inventor :  EUBANKS CURTIS

(54) METHOD AND SYSTEM FOR USING META DATA TO OPTIMIZE PROVISION OF MEDIA DATA

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a system where a contents provider can control provision of media data including provision of video and audio data and provision environment of the video and audio data.

SOLUTION: A supply source for meta data that describe optimum view parameter for medium data exists in the system and a receiver receives the meta data from the supply source. The receiver receiving the meta data uses a local device network to provide media data to optimize a provision environment to users. The receiver provides the media data to viewers with a configuration of taking preference information of users into account.

## CLAIMS

[Claim(s)]

[Claim 1]An optimization system characterized by comprising the following for optimizing offer of media data.

A dispensing means for distributing metadata which indicated a suitable media offer parameter.

A reception means for receiving this metadata.

A correlation means for associating media data and metadata.

A providing means for providing this media data according to this metadata related with ** Li this media data by this correlation means.


[Claim 2]The optimization system according to claim 1wherein this dispensing means distributes this media data and this metadata in the same data stream.

[Claim 3]The optimization system according to claim 1wherein this reception means is connected to a network and this metadata has indicated a parameter about two or more apparatus connected to this network.

[Claim 4]The optimization system according to claim 1wherein it has a judging means for judging a user's taste further when this media data is providedand this providing means provides this media data based on a user's taste judged by this judging means.

[Claim 5]The optimization system according to claim 1 executing this program code including a program code which this metadata can execute in order that this providing means may optimize offer of this media data.

[Claim 6]The optimization system according to claim 3 having further at least one gateway means for communicating with an offer parameter of apparatus connected to a network other than a network of this reception meansand changing.

[Claim 7]The optimization system according to any one of claims 1 to 5

characterized for this media data being broadcast by things.

[Claim 8]An optimization method characterized by comprising the following for optimizing offer of media data.

A step which distributes metadata which indicated a suitable media offer parameter.

A step for receiving this metadata.

A step which associates media data and metadata.

A step which provides this media data according to this metadata related with this media data.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the system for optimizing the metadata which is a parameter for multimedia offerand improving offer of multimedia data based on the optimized metadata especiallyabout offer of multimedia information.

[0002]

[Description of the Prior Art]Standardization of the digital video for broadcast is advanced all over the world. In North Americadigital terrestrial television is based on the written standards of the advanced television standard committee (ATSC) which has a statement in document A / 53 of an ATSC digital television standard. In other areas in Europe and the worlddigital video broadcast (DVB) is adopted as a digital video broadcasting standard. Refer to ISO/IEC IS 13818-1an international standard (1994)and MPEG-2 system. These standards and other standards are based on the MPEG-2 transport mechanism. By this MPEG-2 transport mechanism[ that the simultaneous broadcasting of multimedia data is

possible and ] The simultaneous broadcasting of the non-media data relevant to the media data of electronic program guide (EPG) informationa closed caption texta excecutable byte codeetc. is also possible.

[0003]As a result of these developmentthe format of multimedia contents can be more flexibly determined now for a contents developer or a broadcasting station. For exampleby the ATSC digital television standardMPEG-2 profile from which 18 differs in all is provided. These MPEG-2 profiles differ in an attribute called the aspect ratio and line-scan scheme of the number of lines of a pixela row numberand a pixel. It can relate with a program also about two or more audio tracks and closed text channels.

[0004]

[Problem(s) to be Solved by the Invention]In the existing broadcasting standardchanging the mode at the time of a user's apparatus providing media content had restriction. For examplealthough volume can be raised by increasing the amplitude of an audio signalthe change of **** is very restrictive within the limits of the existing broadcasting standard.

[0005]The content provider desires to improve offer and provision environment of the video and the audio which are not made if the existing broadcasting standard is used. If the improvement in provision environment is dark in the screen while he is watching the movie on television for examplea ** case will be referred to as making dark the room on which television is putand the atmosphere at the time of this gentleman seeing a movie rises. Or a content provider may think that it is made to like to understand a detail also on a dark screen by adjusting the gamma value of a video display unit. Special effects can be added to a program by performing other adjustments of adjusting a room temperature or adjusting the sound of the room.

[0006]Thenan object of this invention is to provide a system for a content provider to enable it to control by the method which cannot perform offer of media data including the provision environment of videooffer of an audio and videoor an audio if the existing broadcasting standard is used.

[0007]

[Means for Solving the Problem]To achieve the above objectsthe system according to claim 1A dispensing means for distributing metadata which indicated a suitable media offer parameterIt has a reception means for receiving this metadataa correlation means for associating media data and metadataand a providing means for providing this media data according to this metadata related with ** Li this media data by this correlation means.

[0008]Both sides of a direct offer parameter like display brightness or picture contrast and provision environment parameterssuch as ambient air temperature and the surrounding luminosityare included in a suitable media offer parameter by this invention. Both sides of televisiondirect offer apparatus like a sound decoderand environmental offer apparatus like a light volume regulating system or a thermostat are included in a providing means. Since a providing means is as above-mentioneda providing meansFor examplemedia data may be indirectly provided by generating a video data and audio information by changing provision environment like [ in a case of providing media data directly and adjusting a luminosity and temperature of a room ].

[0009]In the system according to claim 2this dispensing means is characterized by distributing this media data and this metadata in the same data stream.

[0010]In the system according to claim 3this reception means is connected to a network and this metadata is characterized by having indicated a parameter about two or more apparatus connected to this network.

[0011]In the system according to claim 4when this media data is providedit has a judging means for judging a user's taste furtherand this providing means is characterized by providing this media data based on a user's taste judged by this judging means. Herethis judging means should just be a user interface as which a user enables it to specify a controlled instrument which should be controlled by metadata. In additionor this judging means may be a user's history library as this substitute. who uses a receiver now or what that person's taste of this history library isand its person -- the past (setting in a user history) -- a standard method

when application judges what kind of operation was carried out and that it was is provided.

[0012]In the system according to claim 5this metadata is characterized by including a excecutable program code. In this casethis providing means executes this program codein order to optimize offer of this media data.

[0013]In the system according to claim 6it is characterized by having further at least one gateway means for communicating with an offer parameter of apparatus connected to a network other than a network of this reception meansand changing.

[0014]Claim 8 written this invention is characterized by step which distributes metadata which indicated a suitable media offer parameterand a thing which receive this metadata and for which the following was comprised without accumulating and being alike.

Step.

A step which associates media data and metadata.

A step which provides this media data according to this metadata related with this media data.


[0015]

[Embodiment of the Invention]The method and system by an embodiment of the invention are explained based on an accompanying drawing.

[0016]Drawing 1 shows this invention the functional block diagram of the system by an embodiment. The system of explanation shown in drawing 1 for convenience has classified the transmitting side and a receiver. As for the metadata offer origin 1athe transmitting side is provided with the auxiliary data provider 1bthe control data provider 2the media data provider 3the multiplexer 4and the transmitter 5. The receiver is provided with the receiver 6the display 7 for televisionsthe network 8and the lookup service 17. In the receiverit has the apparatus 13 thru/or 15 connected to the interface 8 via the control modules 9 thru/or 11respectively.

[0017]The metadata offer origin 1a provides metadata. The optimal offer parameter when this metadata is provided with the media data which the media data provider 3 supplies is described. If another word is carried outthe metadata offer origin 1a will have added the metadata which described the offer parameter of capability increase to media data. Metadata has described the offer parameter using a standard data format like XML. The XML itself is common knowledge and it is defined into the specifications advised by the World Wide Web meeting (W3C).

[0018]The multiplexer 4 multiplexes metadatathe ancillary data supplied by the auxiliary data provider 1b who accompanies itand the control data supplied by the control data provider 2. The transmitter 5 transmits the data stream generated by the multiplexer 4.

[0019]Drawing 2 shows the example of transmitting side composition based on an international telegraphic communication union digital terrestrial television broadcasting model. In this examplethe media data provider 3 has the video subsystem 3a and the audio subsystem 3b. The video subsystem 3a performs source coding of a video dataand compression. Compression is performed using an MPEG-2 coding scheme. The audio subsystem 3b performs source coding of audio informationand compression by an AC-3 audio coding standard.

[0020]Service Multiplex / transport system 4 is constituted by the service multiplexer 4a and the transport encoder 4bcombines various signal components and prepares them for broadcast. The service multiplexer 4a multiplexes ancillary data and control data to a single signal at the video datathe audio informationand it which were compressed. The transport encoder 4b has packet-ized the signal using MPEG-2 transport-stream syntax.

[0021]RF / transmission system 5 is provided with the transmitter 5c for broadcasting the signal from the channel coding machine 5athe modulator 5band the service Multiplex / transport system 4. A signal is changed in order that the channel coding machine 5a may protect a signal from an error. The signal which the modulator 5b modulates the digital signal on a carrier frequencyand was

modulated is broadcast from the transmitter 5c.

[0022]Drawing 3 shows the layout of domestic receiver apparatus. In each part storethe flat-panel display 13the lights 14 and 15and the television that becomes it from the receiver 6 and the display 7 are arranged. The receiver 6 and the display 7 are connected by the communication channel 7a. As shown in drawing 3when the receiver 6 and the display 7 are physically constituted as the same unitthe communication channel 7a is realized by the internal bus. A conventional analog or digital contact for videos may be sufficient as the communication channel 7aand network 8 itself may be sufficient as it.

[0023]The receiver 6 is provided with the control interface 6a for connecting with the apparatus 13 thru/or 15 via the physical network 8. The example of the control interface 6a is indicated by U.S. Pat. No. 5940387. If the receiver 6 receives a signal from the transmitter 5cthe receiver 6 will decrypt a signal in the form which made the coding procedure of transmitting side composition reverse. The receiver 6 extracts metadata and analyzes the offer parameter described by metadata. The receiver 6 sets a parameter like display brightness which can be controlled directlyfor exampleand it sends out other offer parameters to the apparatus 13 thru/or 15 via the network 8 suitably. Hereafterto an offer parameterit is a device which can answer and the apparatus of an adjustment object will be called a controlled instrument.

[0024]The receiver 6 and the controlled instruments 13 thru/or 15 must share a common appliance control language. To an appliance control standardX10share wave digital wireless (ShareWave Digital Wireless)Many kindssuch as universal plug and play of CE bus standardHomePNAand Microsoft Corp.HAVIand Jini (registered trademark)exist.

[0025]The receiver 6 and the controlled instruments 13 thru/or 15 are connected to the network 8As long as the address of each logic apparatus is specifiedthe physical network 8 is realizable also with a ** local home network or the network of other kinds so that it may be an IEEE1394 (i link [RT]) network. at presentin both a cable and radiomany network standards for connecting domestic apparatus

exist and swerve -- having -- it is in rivalry. There are EthernetHomePNAinterrogee spa sportetc. as an example of a network standard. [0026]It is usable in which apparatus with the network 8and the lookup service 17 holds the information what kind of service can be received and what should be done for that purpose. When the receiver 6 receives the offer parameter in a broadcasted broadcasting streamsince the lookup service 17 specifies which apparatus is a controlled objectit is used by the receiver 6. Like the example shown in drawing 1lookup service 17 can be made another composition in the receiver 6. It is also realizable with the software or the hardware module which incorporated the lookup service 17 in the receiver 6or other network equipment. As an example of advanced appliance control / network standardthere are discoverya specific protocoletc. of other apparatus which realize universal plug and playHAVIJinior refined lookup service.

[0027]Drawing 4 shows the hardware constitutions of the receiver 6. The receiver 6 is constituted by the tuner 61the processor 62the network controller 63the local RAM 64and the controller 65 for input devices. Although the processor 62 is connected to other subsystems of the receiver 6 by separate busit may be made for a subsystem to share the same bus that brings about the same result in this embodiment.

[0028]The tuner 61 inputs the abnormal-conditions video signal sent from the transmitter 5crestores to the signaland outputs a video signal to the display 7. The processor 62 outputs a control signal to the tuner 61and receives a condition signal from the tuner 61. The network controller 63 performs access to the network 8. The controller 65 for input devices is used in order to intercept the signal from the input device 18.

[0029]The input device 18 communicates with the receiver 6 with a communications protocol. As the input device 18the infrared remote control which communicates with the receiver 6 by infrared ray communicationor a mouse can be used. The receiver 6 is controlled by the input from the input device 18.

[0030]Drawing 5 is the flow chart which showed the outline of the algorithm for assigning an offer parameter to the apparatus 13 thru/or 15and is performed by the processor 62 in the receiver 6. This algorithm is started from Step S101.

[0031]In Step S102the receiver 6 receives the metadata which described the offer parameter. According to this embodimentmetadata is multiplexed to MPEG-2 stream and embedded at the video signalfor example. Or it may be made to receive metadata from another network like the Internet or a wireless network.

[0032]The receiver 6 extracts metadata and analyzes the offer parameter described by metadata. The receiver 6 creates a parameter listsets it as a number of parameters while listing a parameter countand sets the parameter of the beginning under list as the "present parameter." This the "present parameter" is the target of subsequent processing.

[0033]In Step S102the receiver 6 performs correlation for the parameter in a parameter list with the program under present viewing and listening. This correlation processing is performed by relating with peculiar program ID in which each parameter was provided by suitable TV standard. For examplea desired offer parameter can be related with the peculiar program identifier (PID) indicated to the program / episode / version discernment document A / 57 of the advanced television system committee (ATSC) in ATSC digital broadcasting.

[0034]S110 constitutes the parameter processing loop from Step S103. That isin Step S103it judges whether the parameter count became zero and it is judged whether there is any unsettled parameter. If there is no unsettled parameterit will complete and the processing by a parameter processing loop will end processing at Step S111.

[0035]By S109a parameter single from a parameter list is processed from Step S104. The subject equipment of a parameter is judged in Step S104. When subject equipment is the receiver 6processing progresses to Step S108. When subject equipment is other apparatusprocessing progresses to Step S105.

[0036]In Step S108it is judged whether the parameter which the receiver 6 makes the present processing object is supported. It is because the functions

currently supported also differ according to the pricea manufacturing makerand technical contents when the molds of a receiver differ. If the receiver 6 is supporting the parameter and it will not progress and support to Step S109it progresses to Step S110.

[0037]In Step S109the receiver 6 changes the internal adjustment so that the parameter taken into consideration now may be suited. For examplewhen it is described that it should have presupposed that a broadcasting station should make contrast strongtherefore the video signal should have been correctedthe receiver 6 will change the internal adjustment so that the changed video signal may be suited.

[0038]In Step S110decrement of the parameter count is carried out and the next parameter in a parameter list is chosen as a present parameter. And a program execution loop returns to Step S103.

[0039]In S107the parameter of apparatus other than receiver 6 is processed from Step S105. In Step S105the receiver 6 finds out the apparatus which suited the apparatus relevant to the present parameter using the lookup service 17. For examplethis parameter is connected with both lights 14 and 15 or one side when the present parameter is a luminosity parameter. The lookup service 17 is explained in full detail below.

[0040]If applicable apparatus is foundin Step S107the receiver 6 sends out the command for controlling the subject equipment suitable for a desired offer parameter with reference to the information in the lookup service about subject equipment. For examplewhen the offer parameter expresses the specific light intensity in provision environmentthe receiver 6 sends out a command to the light with reference to the information about the target lightand it is made for the light to become target light intensity.

[0041]When applicable apparatus is not found(S106:NO) and its parameter are disregarded and carry out repeat execution of the parameter processing loop via Step S110.

[0042]Table 1 shows the example of the information included in the lookup

service 17 for selecting an applicable controlled instrumentwhen an offer parameter is set. Usuallyalthough this table is provided in the receiver 6it is also manually incorporable in the receiver 6 via an interactive setup program.

[0043]

[Table 1]

[0044]The "logic apparatus" of the single figure of Table 1 lists all the apparatus according to a specific appliance control protocol. Even if it is single apparatus physicallytwo or more logic apparatus may be included. For examplea tuneran audio amplifiera displayand clock logic apparatus are included in the television as physical equipment.

[0045]"Apparatus ID" of the double figures in front is apparatus ID peculiar to each logic apparatus. With a network addresslogic apparatus ID is neededwhen an apparatus command is sent out. In some apparatus command protocols [ like ] which are X-10apparatus ID and network ID are the same.

[0046]The kind of each logic apparatus is described in the "apparatus kind" of the triple figures in front. It is also possible to describe the list of apparatus kinds which can be specified as an appliance control protocol by the integer or a binary number sequence. An apparatus kind can be specified by manual operationor can also be automatically specified via a network equipment Discovery protocol.

[0047]"Place ID" of the 4th figure relates each controlled instrument with one or the Boolean part store beyond it among front. In this exampletwo placesi.e.sitting room and a bedroomare pinpointed for the peculiar integerrespectivelyas shown in Table 2.

[0048]

[Table 2]

[0049]When the offer parameter expresses what the surrounding provision

environment of a certain apparatus should be changed forthe receiver 6 needs to get to know what kind of apparatus exists around a certain apparatus concerned. For examplewhen the offer parameter which the receiver 6 received expresses what the lighting of the display 7 circumference in sitting room should be changed forthe receiver 6 is not the light 14 at a bedroomand must send suitable control commands to the illuminator 15 in sitting room.

[0050]For this reasonas shown in Table 1at least one physical place is assigned to each logic apparatus. Howevertwo or more physical places are assigned about some apparatus. For exampletwo place ID may be assigned to the light source which illuminates two rooms. There may also be apparatus independent of a place. For exampleall the places may be assigned about a modem or communication equipment like a home gateway. It is because communication equipment can be effectively used at all the places where the network is instituted irrespective of the actual physical place unlike the apparatus for lighting up only one room like lighting.

[0051]Some network standards have the lookup facility for finding out the physical place of apparatus. In order to judge whether a command is sent to specific apparatusit is preferred to use such lookup facility as the lookup service 17. Howeverwhen such lookup facility is not contained in the network standardlookup service 17 can be realized in a simple table as shown in Table 1 which associated apparatus and those places. In this caseeach Boolean part store is related with peculiar place ID as it is in the example shown in Table 2. The information in Table 1 and Table 2 is incorporable into the receiver 6 by manual operation using an interactive setup program.

[0052]In Table 1the 5th figure relates network ID with each logic apparatus. A strict format is based on the network protocol currently used. A name can be used instead of a network address. This is a case where the name service which can change a name into a network address can be used by a local network.

[0053]Although it is thought that there are some TV viewers who do not want to change the viewing environment of their own housein this embodimentthe user

interface that a user can restrict access of appliance control is provided. Processing of this user interface is expressed with the flow chart shown in drawing 6 and drawing 7. A user operates a user interface using the remote control 18and selects which apparatus on a home network should be controlled by metadata the offer parameter was described to be.

[0054]Firstin Step S200as shown in drawing 8the appliance control setup screen 400 is displayed on the display 7. The appliance control setup screen as an initial screen of a user interface is displayed on Screen 400. A user chooses the choice which a user wishes highlighting any one of the choices 401402 and 403 using the remote control 18. The choice 401 is chosen when controlling all the apparatus connected to the local network using the metadata which described the parameter made suitable. The choice 402 is chosen when not controlling the apparatus using the metadata which described the parameter made suitable. In choosing the choice 401 or neither of 402it updates (S202 or S204:YES)and a controllable equipment list (S203S205)and this completes a setup.

[0055]The choice 403 is chosen when controlling about some apparatus connected to the local network using the metadata which described the parameter made suitable. When this choice is chosenthe equipment-selection routine shown in (S204:NO) and drawing 7 can be performedand the user can carry out now that selection which should make which apparatus a controlled object.

[0056]Firstin Step S207as shown in drawing 9the equipment-selection screen 410 is displayed. a group which serves as an object for which a user performs setup operation succeedingly in Screen 410 -- apparatus is selected. The user can choose the choice 411412 or either of 413 as shown in the figure. Selection of the choice 411 will express Screen 420 shown in drawing 10 as Step S210 (S209:YES). All the apparatus connected to the local network as the items 421-424 is displayed on Screen 420. The user can select apparatus to control by metadata. If the depression of the selection button in which the user is displayed is carried outa program will progress to Step S216a controllable equipment list

will be updatedand a routine will be ended here.

[0057]A user's selection of the choice 412 will express Screen 430 shown in drawing 11 as Step S212 (S211:YES). The user can choose a controllable apparatus kind from Screen 430 by metadata. The example of the apparatus kind is shown in drawing 11 at the items 431-438. If the depression of the selection button in which the user is displayed is carried outa program will progress to Step S216.

[0058]Selection of the choice 413 (S211:NO) will express Screen 440 shown in drawing 12 as Step S214. The permission or denial of the appliance control in the place can be inputted to each place registered. Item "house whole" It is for 441 inputting the permission or denial of control of the apparatus in all the places. In the example shown in drawing 12two roomssitting room442 and "bedroom" 443are registered. If the depression of the selection button in which the user is displayed is carried outa program will progress to Step S216. Each user of a home network can make it setting out according to liking of everybody including selection of the above-mentioned apparatus. In that caseeach user is specified as a system and the means for memorizing each user's liking independently becomes **. The method of user specification is common knowledge from the former. As an easy specific methodit is that each user owns the remote control for receivers of personal use. Peculiar ID is assigned by each remote control and the ID is sent along with each command. Making ID and its use user of a remote control correlate by a receiver end can make easily.

[0059]Simple apparatus like lighting and a temperature control machine is controlled via a low speed usually like X-10and a resumption network. A high-speed digital network like an analogue network like a coaxial networkIEEE1394or a fiber is needed for the apparatus which transmits and receives an audio or high bandwidth data like video. There are some which need the network which suited IP (Internet Protocol) in other apparatus. It is not rare that a network which is different from these reasons even if it is in the same home lives together. It is usableif the Gateway between networks can be used even if a receiver is

apparatus which exists on a different network.

[0060]Drawing 13 shows the modification of this embodiment and comprises a network of plurality [ provision environment ]. As shown in drawing 13the two networks A and B are connected by Gateway 25. Gateway 25 has accumulation lookup service and the apparatus input part to both the network A and B is contained in accumulation lookup service. The network A comprises the apparatus 26 and the receiver 27. The network B comprises the network equipment 28 and the subject equipment 29 which sends an offer parameter. Gateway 25 is provided with the interpretation capability of the protocol used for both the networks A and Band the network A and the network B2 ** network address are assigned.

[0061]If the receiver 27 receives the parameter turned subject equipment 29the receiver 27 will use the accumulation lookup service in Gateway 25. Gateway D305 performs address translation and conversion of an appliance control protocol to the apparatus of the network D303.

[0062]Opening service Gateway specification is used for the apparatus Gateway protocol in the modification. It is to provide this opening service Gateway specification from the opening service Gateway initiative (OSGi)and to be used generally. In the Gateway which suited opening service Gateway specificationsince apparatus is specifiedthe access manager architecture of OSGi apparatus can be used.

[0063]In another modification of this inventionthe code in which the execution for describing a provision environment parameter is possible is included in metadata. Those who used the excecutable code compared with the case where static metadata is used can change provision environment with flexibility more. That isin order to change provision environmentit is unreal for a content provider to list all possible situations. When how a content provider changes provision environment new is developedit becomes impossible to direct thoroughly what kind of processing user apparatus should carry out in the metadata used now. When changing provision environment using a excecutable codethe code which

can be executed in order to take a local situationa utilization historyand personal information into consideration can also be used. Provision environment can be changed by interactive mode using the code in which this execution is possible.

[0064]In excecutable codethe example explained below is the thing which enabled it to perform a televiewer's favorite office as background music of a TV commercialand can stimulate consumers' attractiveness to consumers by adding this function. In addition to the metadata containing the above-mentioned offer parameterthe application of the byte cord formation which can be performed is created in the metadata offer origin 1a. In this examplethis application is written by the Java™ programming language. Java™ application serves as many Java™ class files from an additional data file depending on the case. The Java™ programming language is preferred as byte cord formation which can be performed. It is because it is used by the extensive hardware platform and high-level mutual operation can be performed certainly. Howeverit can be used even if it is the existing byte cord formation in which other execution is possible.

[0065]A Java™ class and other files are bundled with a single archive file ("jar file")and are coded with other metadata parameters. An archive file is sent out to a televiewer's origin using the transmission system shown in drawing 2.

[0066]Drawing 14 shows an example of the software architecture of the receiver 6. Download and execution of a code can be performed by the architecture shown here. This architecture is also realizable by another apparatus on a set top boxa home serveror a home network like a personal computer. In that casethe receiver 6 will send download application to apparatus applicable in the same procedure as the case where an offer parameter is used.

[0067]Hardwarethe software of lower order like firmwarethe operating systemand the device driver are contained in the lowest level 500 of the architecture. A device driver is for performing the control and communication between hardwarean operating systemand the Java™ virtual machine 501. When the Java™ virtual machine 501 carries out a Java™ programming languageit is a well-known thing.

[0068]The Java™ standard class library 502 is a library where the lot was known welland provides a required or useful function for application or other libraries. As an example of the library 502there are graphicsa user interface library (java.awt)a network library (java.net)an I/O library (java.io)etc.

[0069]in user taste / history library 503who is using the receiver now -- a user's taste -- some -- or the past -- how -- the standard method of the application for judging whether action was taken (user history) is provided. The standard from which many which are called MPEG-7 and TV-Anytime to user taste / history differ is in a developmental stage. It is necessary to make user taste / history library individually until these development is completed.

[0070]An apparatus lookup / control library 504 is equivalent to the Java™ language interface to the lookup service 17 and the control interfaces 6a1314and 15.

[0071]Control of the media data of a video dataaudio informationetc. can be performed by Media Library 505. The version 2.0 of a Java™ media framework (JMF) can be recommended to this ********. A Java™ media framework is an application programming interface (API) for including time-axis media in Java™ application and an applet. JMF2.0API captures and memorizes media data using a custom codeand provides the support at the time of broadcastingand operating media databefore being needed.

[0072]Contents reference / break-through library 506 provides "refer to the contents like the intrinsic identification child to reference contents." The mechanism for discovering the position of contents based on refer to the contents is also provided. Some contents reference schemes which are standardized by society OBU motion picture and television ene JINIAZU (SMPTE) and the content ID forum cIDf exist. A break through of a position is executable as a table look-up. This table look-up is related with a contents reference identifier and a contents locator like the universal resource locator (URL) of a local network. This URL can pinpoint the position on apparatus like a CD playerand apparatus like the track number of music.

[0073]It is accessible in the download application 507 to the standard class library 502the user taste / history library 503an apparatus lookup and the control library 504Media Library 505and contents reference / break-through library 506.

[0074]Drawing 15 is the flow chart which showed the outline of the processing which the receiver 6 performs by "background MYUJIKKU" contained in the above-mentioned metadata which received. In Step S600the present televiewer's judgment which used user taste / history library 503 with application is performed.

[0075]In Step S601application retrieves the present televiewer's taste using user taste / history library 503 again.

[0076]In Step S602a televiewer's favorite music is determined based on a user taste library. It may be the music which the user indicated to be a televiewer's favorite musicand may be the music performed most frequently or recently. The standard of favorite music is extracted and the place of the music on a local network is discovered using the standard. The music memorized by the hard disk drive by this break-through processing is discoveredor the music on the CD changer connected to the local network is discovered. It is used in order to discover contents reference / break-through library 506 with reference to a user's favorite music. Application is stopped when the music is not able to be discovered from the position referred to.

[0077]In Step S604application discovers audio equipment like an audio amplifier with reference to an apparatus lookup / control library 504. This audio equipment reproduces the demanded music and is arranged at the same position as the display 7. Application is stopped when suitable apparatus is not found.

[0078]In Step S605music is performed with applicable audio equipment using Media Library 505and the apparatus lookup / control library 04.

[0079]Although "background MYUJIKKU" was explained to the example abovethis is only one in many examples which can provide download applicationin order to change viewing environment. An advantage produces many of change of viewing environment made using local information like a user historyuser tasteand an interactive dialog with a user by using the downloaded

excecutable code. What a user's favorite music should be made into background musicand should be performed for using the single bit of static metadata can be directed. Howeverthe situation where a receiver can recognize this single bit must be established. Howeveras mentioned aboveabout the changing method of a provision environment parametera downloadable code is far supple.

[0080]Although this invention was explained in detailreferring to a specific embodimentit is possible to add various change and change to the above-mentioned embodiment.

[0081]For examplealthough media data and metadata were supplied in the embodiment using the terrestrial broadcasting systemit is like IP (Internet Protocol) on healtha cableEthernetor a fiber -- it may be made to perform supply of media data and metadata using a kana conveyer style in any way. ."RealVideo. (Registered trademark) "and "Windows (registered trademark) In the unicast or multicasting like the video on demand on the network through the "pull (pull)" model like the streaming video of Media"or a media stream. Supply of media data and metadata may be performed. Supply of media data and metadata may be performed from a local source like a hard disk or DVD.

[0082]It is not necessary to supply media data and metadata by the same data streamand may be made to supply them by another data stream using a certain above-mentioned different means.

[0083]It may be made to control apparatus using the feedback loop based on the environment which the receiver 6 detected using the sensor and other apparatus for detecting provision environment. In this caseprocessing of Step S107 in the flow chart of drawing 5 will be replaced by the routine expressed by the flow chart shown in drawing 16. For exampleit may be made to detect the ambient-light intensity of the lighting 7 using the photo sensor 20 like a photometeras shown in drawing 3. In this casethe light intensity detected by the photo sensor 20 is judged at Step S301. Subsequentlyit is judged whether it is in agreement with the light intensity described by the metadata which the light intensity detected by the sensor 20 received. If not in agreementthe lighting 15 will be adjusted at Step

S303. Subsequentlya routine returns to Step S301and loop processing is repeated until light intensity reaches a desired value. There are a temperature control machine and a hygrostat as other examples of detection equipment. Howeversince temperature and humidity are quickly uncontrollable like light intensityit is preferred to perform the routine shown in drawing 16 as an interruption routine. In this caseafter apparatus is adjusted at Step S303it is made to endand repeat execution of the interruption routine is carried out until it is in agreement with an offer parameter.

[0084]

[Effect of the Invention]According to the composition according to claim 1the content provider can control now the provision method of the media data to a receiver. He the content provider not only can control direct offer of mediabut can control indirect offer of media data by changing the provision environment in a receiver.

[0085]According to the composition according to claim 2in order to receive media datait is not necessary to use another parts.

[0086]According to the composition according to claim 3the provision environment in a receiver is changeable using the apparatus connected to the network by metadata.

[0087]According to the composition according to claim 4media data can be provided in the form of having been most suitable for each user.

[0088]According to the composition according to claim 5media data is provided in the form which is more flexible compared with the case where metadata is completely static.

[0089]According to the composition according to claim 6provision environment is changeable using the apparatus connected to one or more networks by the receiver using metadata.

[0090]According to the composition according to claim 8the content provider can control the provision method of the media data to a receiver. When he a content provider not only can control direct offer of media databut changes the provision

environment in a receiverindirect offer of media data is also controllable.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The block diagram showing the composition of the higher rank of the system by an embodiment of the invention.

[Drawing 2]The block diagram of the digital terrestrial television broadcasting system by an embodiment of the invention based on an international telecommunication union (ITU-R).

[Drawing 3]The layout plan of a home network under which provision environment and apparatus were connected.

[Drawing 4]The block diagram showing the composition of the receiver of the system shown in drawing 1.

[Drawing 5]The flow chart which showed the offer parameter processing loop of the receiver shown in drawing 4.

[Drawing 6]The flow chart showing the user interface routine by an embodiment of the invention.

[Drawing 7]The flow chart showing the apparatus specific routine in the routine of drawing 6.

[Drawing 8]The schematic diagram showing the appliance control setup screen in the routine of drawing 6.

[Drawing 9]The schematic diagram showing the specific equipment screen of the apparatus specific routine of drawing 7.

[Drawing 10]The schematic diagram showing the screen of all the apparatus of the apparatus specific routine of drawing 7.

[Drawing 11]The schematic diagram showing the specific equipment kind screen of the apparatus specific routine of drawing 7.

[Drawing 12]The schematic diagram showing the specific equipment position

screen of the apparatus specific routine of drawing 7.

[Drawing 13]The schematic diagram showing two apparatus networks connected by the Gateway by the modification of an embodiment of the invention.

[Drawing 14]The block diagram showing the software architecture of the receiver for performing application written with the Java™ programming language.

[Drawing 15]The flow chart which showed the routine for performing a user's favorite music.

[Drawing 16]The flow chart which showed the routine for adjusting provision environment based on the detection result by an environment sensor.

[Description of Notations]

1a Metadata offer origin

1b Auxiliary data provider

2 Control data provider

3 Media data provider

4 Multiplexer (service Multiplex / transport system)

5 Transmitter (RF/transmission system)

6 Receiver

7 Display

9-11 Control module

13 Flat-panel display

14 and 15 Light

18 Input device